

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Previously Presented) A voltage recovery device for connection to a utility power network including a transmission line which carries a nominal voltage and a distribution line network connected to the transmission line network, the distribution line network carrying a distribution voltage less than the nominal voltage on the transmission line network, the voltage recovery device comprising an energy storage unit connected in shunt to the distribution line network and configured to transfer real and reactive power between the utility power network and voltage recovery device at a level and for a duration to recover the voltage on the utility power network to within a predetermined proportion of the nominal voltage, following a fault condition detected on the utility power network.
2. (Original) The voltage recovery device of claim 1 wherein the voltage recovery device is configured to transfer a combination of real and reactive power.
3. Cancelled.
4. (Previously Presented) The voltage recovery device of claim 2 wherein the voltage recovery device is configured to provide real and reactive power to the utility power network to within 0.90 P.U. of the nominal voltage within 0.5 seconds.

5. (Currently Amended) The voltage recovery device of claim 2 further comprising:  
an inverter electrically coupled ~~between the energy storage unit and the utility~~  
~~power~~ to the distribution line network; and

a controller connected to the inverter and configured to control the amount of real  
and reactive power transferred between the energy storage unit and ~~utility power~~ the distribution  
line network.

6. (Original) The voltage recovery device of claim 5 wherein the energy storage  
unit includes a superconducting magnet.

7. (Original) The voltage recovery device of claim 5 wherein the energy storage  
unit is selected from a group consisting of a flywheel, a battery, a capacitive energy storage  
system bank, a compressed gas energy source, and a fuel cell system.

8. (Original) The voltage recovery device of claim 5 further comprising a magnet  
interface connected between the energy storage unit and the inverter.

9. (Previously Presented) A method of stabilizing a utility power network including  
a transmission line which carries a nominal voltage and a distribution line network connected to  
the transmission line network, the distribution line network carrying a distribution voltage less  
than the nominal voltage on the transmission line network, the method comprising:

electrically connecting in shunt a voltage recovery device having an energy  
storage unit to the distribution line network,

detecting a fault condition on the utility power network; and

operating, in response to detecting the fault condition, the voltage recovery device  
to transfer real power and reactive power to the distribution line network at a level and for a  
duration to recover the voltage on the utility power network to within a predetermined proportion  
of the nominal voltage.

10. Cancelled.

11. (Currently Amended) The method of claim 9 further comprising electrically coupling an inverter ~~between the energy storage unit and the utility power~~ to the distribution line network, wherein operating the voltage recovery device including controlling the inverter to control the level of real power and level of reactive power transferred between the energy storage unit and ~~utility power~~ the distribution line network.

12. (Currently Amended) The method of claim [[10]] 9 further comprising configuring the voltage recovery device to provide real and reactive power to the transmission network to promote quick recovery of voltage to within acceptable utility standards within 0.5 seconds.

13. (Currently Amended) The method of claim [[10]] 9 further comprising configuring the voltage recovery device to provide real and reactive power to the transmission network to within 0.90 P.U. of the nominal voltage within 0.5 seconds.

14. (Original) The method of claim 9 wherein the energy storage unit includes a superconducting magnet.

15. (Original) The method of claim 9 wherein the energy storage unit is selected from a group consisting of a flywheel, a battery, a capacitive energy storage system bank, a compressed gas energy source, and a fuel cell system.

16. Cancelled.

17. (Original) The voltage recovery device of claim 1, wherein the real power is transferred from the voltage recovery device at a substantially constant voltage for a predetermined period of time.

18. (Original) The voltage recovery device of claim 17, wherein, after the predetermined period of time, the real power is transferred from the voltage recovery device at a substantially constant rate.

19. (Original) The method of claim 9, wherein the real power is transferred from the voltage recovery device at a substantially constant voltage for a predetermined period of time.

20. (Original) The method of claim 19, wherein, after the predetermined period of time, the real power is transferred from the voltage recovery device at a substantially constant rate.

21. Cancelled.

22. Cancelled.

23. (Currently Amended) A method of stabilizing a utility power network wherein the utility power network includes a transmission network and a distribution network, the method comprising:

electrically connecting in shunt plural voltage recovery devices, each having an energy storage unit, to the distribution network,

detecting a fault condition on the utility power network; and

operating, in response to detecting the fault condition, ~~one or more~~ of the voltage recovery devices to transfer real power and reactive power to the utility power network at a level

and for a duration to recover the voltage on the transmission network to within a predetermined proportion of a nominal voltage.

24. (Previously Presented) A utility power network comprising:  
a transmission line network carrying a nominal voltage;  
a plurality of distribution line networks, each connected to the transmission line network, each of the distribution line networks carrying a distribution voltage less than the nominal voltage on the transmission line network; and  
a plurality of voltage recovery devices, each connected in shunt to at least one of the distribution line networks, and each of the plurality of voltage recovery devices is configured to transfer real and reactive power between the distribution line network and the voltage recovery device at a level and for a duration to recover the voltage on the utility power network to within a predetermined proportion of the nominal voltage of the transmission line network, following a fault condition detected on the utility power network.

25. (Previously Presented) The utility power network of claim 24 wherein each of the voltage recovery devices is configured to transfer a combination of real and reactive power.

26. (Previously Presented) The utility power network of claim 25 wherein each of the voltage recovery device is configured to provide real and reactive power to the utility power network to within 0.90 P.U. of the nominal voltage within 0.5 seconds.

27. (Previously Presented) The utility power network of claim 25 wherein each of the voltage recovery device comprises:

an inverter electrically coupled between the energy storage unit and one of the distribution line networks; and

a controller connected to the inverter and configured to control the amount of real and reactive power transferred between the energy storage unit and utility power network.

28. (Previously Presented) The utility power network of claim 27 wherein the energy storage unit includes a superconducting magnet.

Add the following claims:

29. (New) The method of claim 23 wherein operating one or more of the voltage recovery devices such that the transfer of real power and reactive power to the utility power network in aggregate is at a level and for a duration to recover the voltage on the transmission network to within a predetermined proportion of a nominal voltage.

30. (New) The method of claim 23 further comprising electrically connecting each of the plural voltage recovery devices at line segments of the transmission network having a fault which causes the voltage on the line segment to be less than 90% of the nominal voltage.

31. (New) The method of claim 30 further comprising electrically connecting each of the plural voltage recovery devices at line segments of the transmission network having a fault which causes the voltage on the line segment to be less than 90% of the nominal voltage.

32. (New) The utility power network of claim 24 wherein each of the voltage recovery devices is configured to transfer real power and reactive power to the utility power network in aggregate is at a level and for a duration to recover the voltage on the transmission network to within a predetermined proportion of a nominal voltage.

33. (New) The utility power network of claim 24 wherein each of the plural voltage recovery devices is connected at line segments of the transmission network having a fault which causes the voltage on the line segment to be less than 90% of the nominal voltage.

Applicant : Paul Frederick Koepe et al.  
Serial No. : 09/449,435  
Filed : November 24, 1999  
Page : 9 of 14

Attorney's Docket No.: 05770-092001 / AMSC-440

34. (New) The utility power network of claim 32 wherein each of the plural voltage recovery devices is connected at line segments of the transmission network having a fault which causes the voltage on the line segment to be less than 90% of the nominal voltage.